

WHAT IS CLAIMED IS:

1. A decoder for receiving a multiplexed stream which is obtained by multiplexing plural streams, and carrying out a decoding process for each stream included in the multiplexed stream in a parallel processing comprising:

a demultiplexing unit for separating the multiplexed stream into plural streams by a demultiplexing process;

a decoding unit for carrying out a decoding process for one of the plural separated streams; and

a stream selection unit for selecting one of the plural separated streams and outputting the selected one to the decoding unit, thereby converting a decoding target in the decoding unit from one stream to another stream.

2. The decoder of Claim 1 wherein

said stream selection unit has a position detection unit for detecting a stream switchable position in a stream being subjected to the decoding process, at which position the decoding unit can interrupt the decoding process, and

the stream selection unit performs the stream selection such that the decoding process for the stream which is being processed is interrupted at the stream switchable position.

3. The decoder of Claim 1 comprising:

a stream storage unit for storing each of the plural separated streams by a predetermined amount from a head or stream switchable position thereof to a subsequent stream switch position, wherein

said stream selection unit performs the stream selection such that the streams are output from the stream storage unit, successively from a stream for which the process for storing the stream by the predetermined amount has been completed.

4. The decoder of Claim 1 wherein

each of the plural separated streams is obtained by carrying out a coding process for digital data repeatedly for each predetermined coding unit, and

the stream switchable position in each of the streams matches with a head position or rearmost position of the coding unit.

5. A decoding method for carrying out a decoding process for a multiplexed stream which is obtained by multiplexing plural streams, in parallel for each of streams included in the multiplexed stream comprising:

a demultiplexing process of separating the multiplexed stream into plural streams;

a stream selection process of selecting one of the

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plural separated streams such that a target of a decoding process is converted from one stream to another stream; and

a decoding process of decoding one of the plural separated streams output by the stream selection process,

said stream selection process detecting a stream switchable position in a stream being subjected to the decoding process, at which position the decoding process can be interrupted, and performing the stream selection such that the decoding process for the stream which is being processed is interrupted at the stream switchable position.

6. A decoder for subdividing plural streams into first multiplexing units, receiving a multiplexed stream which is obtained by switching the respective streams successively for each of the first multiplexing units, and carrying out a decoding process for each stream included in the multiplexed stream comprising:

a stream conversion unit for converting the multiplexed stream into a multiplexed stream composed of second multiplexing units which are obtained by gathering a plurality of the first multiplexing units together for the respective streams;

a switch position detection unit for detecting a switch position of each of the multiplexing units in the multiplexed stream which has been converted by the stream

conversion unit; and

a decoding unit for carrying out a decoding process corresponding to each stream on the basis of the switch position information detected by the switch position detection unit.

7. The decoder of Claim 6 wherein

the second multiplexing unit is composed of from the head or stream switchable position of each of the plural streams to the subsequent stream switch position.

8. A decoder for subdividing plural streams into first multiplexing units, receiving a multiplexed stream which is obtained by switching each of the streams successively for each second multiplexing unit obtained by gathering a plurality of the first multiplexing units together for each of the streams, and carrying out a decoding process for each stream which is included in the multiplexed stream comprising:

a stream conversion unit for adding switch position information indicating a switch position of each stream to the multiplexed stream, to perform conversion of the multiplexed stream;

a switch position detection unit for detecting a switch position of each of the multiplexing units in the

multiplexed stream which has been converted by the stream conversion unit; and

a decoding unit for carrying out a decoding process corresponding to each stream, on the basis of switch position information detected by the switch position detection unit.

9. The decoder of Claim 8 wherein

the second multiplexing unit corresponds to from a head or stream switchable position of each of the plural streams to a subsequent stream switch position.

10. A decoding method for subdividing plural streams into first multiplexing units, receiving a multiplexed stream which is obtained by switching each of the streams successively for each of the first multiplexing units, and carrying out a decoding process for each stream included in the multiplexed stream comprising:

a stream conversion process of converting the multiplexed stream into a multiplexed stream composed of second multiplexing units which are obtained by gathering a plurality of the first multiplexing units together;

a switch position detection process of detecting a switch position of each of the multiplexing units in the multiplexed stream which has been converted by the stream

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conversion process; and

a decoding process for decoding each stream, which is carried out correspondingly to the stream on the basis of switch position information detected by the switch position detection process.

11. A decoding method for subdividing plural streams into first multiplexing units, receiving a multiplexed stream which is obtained by switching each of the streams successively for each second multiplexing unit obtained by gathering a plurality of the first multiplexing units together for each of the streams, and carrying out a decoding process for each stream included in the multiplexed stream comprising:

a stream conversion process of adding switch position information indicating a switch position of each stream to the multiplexed stream, to perform conversion of the multiplexed stream;

a switch position detection process of detecting a switch position of each of the multiplexing units in a multiplexed stream which has been converted by the stream conversion process; and

a decoding process for decoding each stream, which is carried out correspondingly to the stream, on the basis of the switch position information detected by the switch

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position detection process.

12. A multiplexer for multiplexing plural streams which are obtained by coding plural digital data, and outputting a multiplexed stream comprising:

a position detection unit for detecting a switchable position in a stream to be multiplexed, at which position a decoding process for the stream can be interrupted; and

a multiplexing unit for carrying out a multiplexing process of dividing each of the streams at the switchable position to generate divided stream parts corresponding to each stream and multiplexing the respective streams taking the divided stream part as a unit, to output the multiplexed stream.

13. The multiplexer of Claim 12 wherein

the multiplexing unit carries out the multiplexing process such that information which identifies the switchable position corresponding to each stream is included in the multiplexed stream.

14. The multiplexer of Claim 12 wherein

each of the streams is obtained by carrying out a coding process for digital data repeatedly for each predetermined coding unit, and

the stream switchable position of each of the streams matches with a head position or rearmost position of the coding unit.

15. A multiplexing method for multiplexing plural streams which are obtained by coding plural digital data, to generate a multiplexed stream comprising:

a position detection process of detecting a switchable position in a stream to be multiplexed, at which position a decoding process for the stream can be interrupted; and

a multiplexing process of dividing each of the streams at the switchable position to generate divided stream parts corresponding to each stream, and unifying the divided stream parts by the respective streams to generate the multiplexed stream.

16. The multiplexing method of Claim 15 wherein the divided stream part includes a plurality of multiplexing units each having a predetermined stream length.

17. A multiplexing method for carrying out a multiplexing process for plural streams which are obtained by coding plural digital data, to generate a multiplexed stream comprising:

a position detection process of detecting a switchable position in each stream, at which a decoding process for the stream can be interrupted;

a division process of dividing each stream by a predetermined stream length, to generate divided stream parts as multiplexing units; and

a header information addition process of adding, to a head of each of the divided stream parts, header information for identifying a corresponding stream wherein a flag is added to header information corresponding to a divided stream part, an end position of which matches with a switchable position of the stream, for indicating that the end position matches with the switchable position of the stream.

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